

Response to Comments Document

Bacteria Total Maximum Daily Load (TMDL) for North River in Rockingham County, Virginia

Introduction

A final public meeting was held for the North River TMDL on November 14, 2005. The draft TMDL report (Bacteria Total Maximum Daily Load (TMDL) Development for North River) was presented at the meeting and made available on the DEQ website. The benthic stressor identification report for North River, which identified that a benthic TMDL was not necessary, was also presented at the final public meeting and made available on the DEQ website. A public comment period on the draft TMDL report and the stressor identification report was held from November 14, 2005 until December 14, 2005. During the public comment period, two individuals submitted comments. The comments from each commenter are presented below, followed by DEQ's response to the comment.

Comments Submitted by Nesha Mizel and Charles Lunsford (DCR)

Comment 1

The relationship between e.coli and fecal coliform should be better clarified in the executive summary. Standards for both are referred to in the executive summary; however, only fecal coliform is discussed in the sub-section that describes modeling the fate and transport of bacteria in the subwatersheds (Section 1.2.3). It is unclear from this section what data was used in the model, fecal coliform or e.coli. Including the last sentence on page 28 of the following chapter in the executive summary would better clarify model input and output.

Response

The Executive Summary of the report was modified to more clearly describe the relationship between E. coli and fecal coliform. Additional language from Chapter 2 was added to the Executive Summary to describe that while the modeling was conducted using fecal coliform inputs, a translator equation was used to convert the output to E. coli. Using this approach, the TMDL was developed to meet the E. coli standard.

Comment 2

On page 11 it should be specified which GM standard was modeled. A portion of the North River TMDLs (those completed prior to 2004) were modeled with a fecal coliform geometric mean of 200 cfu/100 ml. Those completed in 2004 were modeled at an E. coli GM of 126 cfu/110ml. So how were these TMDLs developed under different bacteria standards actually modeled to determine the allocations in the North River TMDL. If the North River TMDLs completed prior to 2002 were modeled at a GM of 126cfu/100 ml then this is wrong.

Response

As described above in the response to Comment #1, modeling was conducted using fecal coliform inputs, and then DEQ's translator equation was used to convert the output to E. coli. Using the translator equation, the 200 cfu/100 ml fecal coliform standard is roughly equivalent to the 126 cfu/100 ml E. coli standard.

Comment 3

Suggest wording change to last full sentence on page 11. Reword sentence to read, "Approved TMDLs are in place to implement corrective actions to achieve water quality standard in the contributing areas, this report details the further reductions in the North River watershed that are necessary to meet water quality standards in North River."

Response

The suggested change was made.

Comment 4

Page 11. Please use the watershed names to describe the North River areas not hydrologic unit numbers (e.g., B15 that mean nothing to the average citizen), especially the watersheds that the TMDL reductions apply to. This is the Executive Summary and it needs to be clear so a reader does not have to dig into the report to figure out the areas referenced.

Response

The suggested change was made. In addition, Figure 2.1, showing the North River TMDL watershed and the contributing areas with previously developed TMDLs, was moved to the Executive Summary.

Comment 5

Page 15. Text references "reductions in the portion of the NR watershed not covered by a previously developed TMDL". What is this portion? Once again there is not a reference to the areas by watershed name.

Response

Figure 2.1, showing the North River TMDL watershed and the contributing areas with previously developed TMDLs, was moved to the Executive Summary. Watersheds were also described by the stream name rather than watershed codes.

Comment 6

Second sentence in last paragraph on page 15 should be deleted since it is not relevant to this TMDL.

Response

In comments received on a previous TMDL, DCR objected to the selected TMDL allocation scenario. In response, DEQ clarified that any of the modeled allocation scenarios that meet the water quality standard are acceptable targets during implementation planning. This statement is true for any TMDL, so this language was incorporated into subsequent TMDLs, clarifying that the implementation plan steering committee has the option of selecting any successful TMDL allocation scenario.

Comment 7

It would be useful to have more information to support the estimate given on the bottom of page 48 accounting for interflow and groundwater concentrations of bacteria due to downward failing septic systems (60cfu/100mL and 40cfu/100mL, respectively).

Response

During TMDL development, members of the local steering committee expressed concern that failing septic systems in the karst North River area would lead to groundwater contamination rather than pooling at the surface. To account for this concern, the bacteria concentrations

in interflow and groundwater below residential areas were increased by a factor of 2 above background levels. Conservative literature values of 30 cfu E. coli/100 ml in interflow and 20 cfu E. coli/100 ml in groundwater have historically been used as background levels in TMDL development. A doubling of these values in the residential area represents a conservative assumption consistent with the implicit margin of safety used for this TMDL development. The values used in this TMDL are also consistent with groundwater monitoring results in rural residential areas in West Virginia as reported by Pasquarell and Boyer (1995) and Boyer (2005). These references were added to the TMDL to support the increased groundwater values. As it turns out, model results are not very sensitive to this assumption, because even at the doubled concentrations, interflow and groundwater represent less than 1% of the mean daily E. coli concentration.

Comment 8

Phase I of implementation essentially includes no implementation. It seems unwise to encourage landowners to do nothing. It is unlikely that implementation on other existing TMDLs in the North River watershed will be completed in the near future; consequently, we will see little to no improvement in these subwatersheds if we do not encourage landowners to install BMPs. It is unreasonable to ask landowners in adjacent watersheds to implement large numbers of BMPs to achieve substantial reductions in bacteria while their neighbors are asked to do nothing.

Response

The Stage I Scenario included in the TMDL is important, because the 10% violation rate is relevant to water quality assessment methodology, it is a consistent water quality milestone across TMDLs, and in this case, it emphasizes the importance of implementation in the contributing watersheds. While the Stage I Scenario presented in the TMDL shows that water quality violations in North River will be below 10% with implementation of existing TMDLs, this scenario should not limit implementation where appropriate in the North River watershed. By state law, a TMDL Implementation Plan must be developed for full TMDL implementation, which for this TMDL includes reductions for all landuses (except forest) and for all direct deposits (except for wildlife and permitted discharges). The Implementation Plan must also include milestones for meeting those reductions, and it will be up to the Implementation Plan Steering Committee to set those milestones. Because full implementation of TMDLs on North River tributaries is not yet complete, the steering committee may wish to select alternative or additional implementation milestones during the development of the TMDL Implementation Plan in order to speed implementation and attainment of water quality goals in the North River itself. The one interim water quality goal identified in the TMDL should not constrain their decision making in this respect. To clarify this in the TMDL Report, the following language was added: "This Stage 1 scenario indicates that implementation of existing TMDLs on North River tributaries will reduce bacteria violation rates in the North River below 10% without additional reductions from the North River TMDL watershed. However, because full implementation of TMDLs on North River tributaries is not yet complete and may not be attained, watershed stakeholders may wish to select alternative or additional implementation milestones during the development of the TMDL IP in order to speed implementation and attainment of water quality goals in the North River itself."

Comment 9

Using the instantaneous standard as a stage 1 implementation goal in the TMDL is inappropriate. There is not a requirement that the TMDLs have a staged implementation goal and attaining the instantaneous standard does not have to be a staged implementation goal.

What is provided will only result in stakeholders saying in essence that they have to do nothing because the TMDL load allocation does not have to be implemented to "de-list" the stream based on current policy. **DCR does not support using attainment of the instantaneous standard as a stage 1 implementation goal for this TMDL.**

Response

See response to Comment #8 above.

Comment 10

It would be useful to show the number of samples collected over each bar in Figure 3.9.

Response

The suggested change was made.

Comment 11

A 10-year rotation with 4 years of corn-rye and 6 years of hay was assumed, along with 50% of corn acreage being under no-till. Most conservation plans include a rotation of 2 years of corn and 4 years of hay. The 50% no-till assumption seems high depending on the definition of no-till that was used (30% or above for cover would technically qualify as no-till, but does allow for some tillage).

Response

As with many model parameters, there is significant variation across the basin in crop rotation and tillage practices. The assumptions selected to represent the North River basin were based on crop rotation and tillage practice assumptions used in previous Valley TMDLs. Additional information on such practices was requested from the TMDL Local Steering Committee during model development, but no additional information was provided to refine the original estimates. Because the revisions suggested by the comment above represent very small changes in bacteria loading rates and because those changes are toward less conservative bacteria loading assumptions, the original assumptions were maintained in the final TMDL report. This is consistent with the implicit margin of safety used in this TMDL.

In model development, crop rotations are not modeled as successive years under a given practice, because different farms in the basin may be at different points in the rotation. Rather, crop rotations and tillage practices are used to estimate the percent of land in the basin in each crop and tillage practice. For instance, a 4 year corn/6 year hay rotation results in an average of 40% crop and 60% hay over a ten year period across the basin. The suggested 2 year corn/4 year hay rotation would result in a very similar 33% crop and 67% hay over the same ten year period. Given that bacterial loads from all pervious land segments in the TMDL watershed only account for 4% of the North River E. coli concentration, this small difference in land use would likely result in an insignificant change in bacterial loading rates. The suggested reduction in no-till percentage would also likely result in an insignificant change in bacterial loading rates. This change would also leads to a less conservative bacteria loading assumption, because manure applied under the no-till practice is not incorporated into the soil and is available for washoff.

Comment 12

FSTDES is not spelled out in the TMDL document, this parameter should be described, and an explanation as to why is what altered should be provided.

Response

The suggested change was made. The final report described that FSTDEC is the first order decay rate parameter for bacterial dieoff. This parameter is estimated from literature values and is often adjusted within certain acceptable ranges to achieve model calibration.

Comment 13

Information on existing TMDL Implementation Plans could be provided in section 7.3 (Links to Ongoing Restoration) in addition to information on the other TMDLs that have been developed in the North River watershed since this TMDL relies heavily on their complete implementation.

Response

The suggested change was made. Information and links to previously developed TMDLs and Implementation Plans in the watershed were provided in the Links to Ongoing Restoration section.